

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (previously presented) Process for determining the mechanical resistance of a bone from a digitized two dimensional image, obtained by imaging, characterized in that there is carried out a correlation between the bone mineral density determined from this two dimensional image by any means suitable to this type of image and a structural parameter obtained from the same two dimensional image.

2. (previously presented) Process for determining the mechanical resistance of a bone according to claim 1, characterized in that one has recourse to a correlation of the exponential type.

3. (previously presented) Process for determination according to claim 1, characterized in that the correlation associating the bone mineral density and said structural parameter is used to determine the ultimate stress C_u of the bone.

4. (currently amended) ~~Process for determining the mechanical resistance of a bone according to any one of the~~

preceding claims, characterized in that Process for
determining the mechanical resistance of a bone from a
digitized two dimensional image, obtained by imaging,
characterized in that there is carried out a correlation
between the bone mineral density determined from this two
dimensional image by any means suitable to this type of image
and a structural parameter obtained from the same two
dimensional image, wherein there is determined the structural
parameter a obtained by the series of the following steps:

- a) choosing at random a pixel of the two dimensional image which is at the gray level $h(0)$,
- b) choosing a straight line from this point having a direction also determined at random,
- c) moving a distance r along this straight line, $h(r)$ being the gray level of this new point,
- d) computing the variance of the gray levels with the formula: $V(r) = [h(r) - h(0)]^2$,
- e) tracing the curve associated with $V(r)$ on a log-log scale, and
- f) determining the slope of this log-log curve which represents said parameter a.

5. (previously presented) Process for determining the mechanical resistance of a bone according to claim 4, characterized in that steps a) to d) are repeated a number of

times sufficiently great to make the mean variance function $v(r)$ converge over the assembly of the repetitions.

6. (previously presented): Process for determining the mechanical resistance of a bone according to claim 4, characterized in that there is carried out a correlation between the bone mineral density obtained from this two dimensional image and said parameter a evaluated from the same two dimensional image according to the mathematical model:

$$C_u' = b_0 + b_1 * \exp(b_2 * DMO) * a$$

wherein b_0 , b_1 , b_2 are coefficients obtained by nonlinear regression and C_u' the prediction of the ultimate stress C_u of the bone.

7. (previously presented): Process for determining the mechanical resistance of a bone according to claim 4, characterized in that there is determined a correlation between the parameter a and a three dimensional parameter of the trabecular network of the bone.

8. (previously presented): Process for determining the mechanical resistance of a bone according to claim 7, characterized in that the three dimensional parameter of the trabecular network of the bone is the connectivity density x_v

9. (previously presented): Process for determining the mechanical resistance of a bone according to claim 5, characterized in that there is carried out a correlation between the bone mineral density obtained from this two dimensional image and said parameter a evaluated from the same two dimensional image according to the mathematical model:

$$C_u' = b_0 + b_1 * \exp(b_2 * DMO) * a$$

wherein b_0 , b_1 , b_2 are coefficients obtained by nonlinear regression and C_u' the prediction of the ultimate stress C_u of the bone.

10. (previously presented): Process for determining the mechanical resistance of a bone according to claim 5, characterized in that there is determined a correlation between the parameter a and a three dimensional parameter of the trabecular network of the bone.

11. (previously presented): Process for determining the mechanical resistance of a bone according to claim 6, characterized in that there is determined a correlation between the parameter a and a three dimensional parameter of the trabecular network of the bone.

12. (currently amended): Process for determination according to claim 3 2, characterized in that the correlation associating the bone mineral density and said structural

parameter is used to determine the ultimate stress C_u of the bone.

13. (new): Process according to claim 1, wherein said structural parameter is obtained by calculating a variation function.